

REMARKS/ARGUMENTS

Claims 1-27 and 31-58 stand rejected in the outstanding Official Action. Claims 19 and 34 have been cancelled without prejudice and claims 18, 20, 33 and 35 amended. As a result, claims 1-18, 20-27, 31-33 and 35-58 remain in the application.

The Examiner's withdrawal of previous rejections under 35 USC §112 (first and second paragraphs) and under 35 USC §102 over the Rohr et al and Ekins-Daukes et al references is very much appreciated.

The Examiner rejects claims 1-6, 12, 13, 42 and 43 under 35 USC §102 as being clearly anticipated by Ekins-Daukes I ("Strain-Balanced GaAsP/InGaAs Quantum Well Solar Cells" *Applied Physics Letters*). As noted in the previous Amendment, Ekins-Daukes I teaches the desirability of compositions such that the adjacent layers exert substantially no shear force on a neighboring structure. The desirability of this end result is clear from the Ekins-Daukes I reference.

However, as certified by Dr. Anderson's Declaration at paragraphs 10 and 11, those of ordinary skill in the art reading the Ekins-Daukes I reference are not provided with any method for creating layers in which each individual period exerts "substantially no shear force" on a neighboring structure as required by applicants' claims. This method is only disclosed in applicants' specification and therefore even following the Ekins-Daukes I method, one of ordinary skill could not provide a series of layers which "exerts substantially no shear force on a neighboring structure"

Even the Examiner admits that Ekins-Daukes I discloses that there is some average strain, although it considers this to be a "negligible quantity." As set forth in paragraph 11 of Dr. Anderson's Declaration, Ekins-Daukes accomplishes this by the disclosure of a "thickness-weighted average lattice constant approach" as in equation 1 of Ekins-Daukes I." However, as confirmed by paragraph 12 of Dr. Anderson's Declaration, the "thickness-weighted average lattice constant of wells and barriers is roughly the same as the InP substrate **but this is insufficiently exact to ensure periods which exert substantially no shear force on a neighboring structure'."**

As a result, the evidence of Dr. Anderson, an expert in the field of photovoltaic devices and with substantial experience in what would be obvious to those having ordinary skill in the art, has testified that, while the goal of the present invention is suggested in Ekins-Daukes I, there is no disclosure of any way to achieve that goal, i.e., to achieve layers which exert "substantially no shear force on a neighboring structure." If Ekins-Daukes I does not teach any way of accomplishing the claimed structure and applicants' specification provides clear teaching of how to create that structure, then even though Ekins-Daukes I appears to understand a benefit of such a structure, its lack of a teaching does not cause it to be sufficient support for a rejection of applicants' claims under 35 USC §102.

Ekins-Daukes I also cannot support a rejection of applicants' independent claims under 35 USC §103, because there is no suggestion to use the differing method steps or "growing" formulae as disclosed in the present specification. As a result, the Examiner's

continued rejection of claims 1-6, 12, 13, 42 and 43 under 35 USC §102 as being anticipated by Ekins-Daukes I is respectfully traversed.

Claims 7-11, 14 and 15 stand rejected under 35 USC §103 over Ekins-Daukes I in view of Freundlich (U.S. Patent 5,851,310). Because these claims ultimately depend from claim 1 and the above discussion has already pointed out that Ekins-Daukes I does not contain any method step which would enable one to provide strained layers which exert "substantially no shear force" on neighboring structures, Ekins-Daukes I, even if combined with Freundlich, cannot render obvious the subject matter of claims 7-11, 14 and 15. In the discussion of the Freundlich reference, the Examiner does not indicate how or where it teaches this disclosure which is missing from the Ekins-Daukes I reference. As a result, neither Ekins-Daukes I nor Freundlich teaches this operational interrelationship between structures recited in applicant's independent claim 1 and therefore the combination of these two structures would not teach or render obvious applicants' claim 1 invention. Accordingly, any further rejection of claims 7-11, 14 and 15 is respectfully traversed.

Claims 16 and 17 stand rejected under 35 USC §103 as unpatentable over Ekins-Daukes I in view of Freundlich (U.S. Patent 6,150,604; hereinafter Freundlich II). Again, claims 16 and 17 depend directly from applicants' claim 1 and therefore the above feature distinguishing claim 1 from the Ekins-Daukes I reference are herein incorporated by reference.

A review of paragraph 10 of the Official Action does not provide any indication that the Freundlich II (USP 6,150,604) reference provides the disclosure missing from the Ekins-Daukes reference. Accordingly, if both prior art references fail to disclose a claimed feature of applicants' claims, even if they were combined, they could not render obvious applicants' combination. Here the Examiner has not pointed out where or how this feature is taught in the prior art references, nor has he provided any basis for combining the references. Accordingly, any further rejection of claims 16 and 17 under 35 USC §103 is respectfully traversed.

Claims 18, 23 and 25-27 stand rejected under 35 USC §103 as unpatentable over Freundlich I. Independent claim 18 specifies a photovoltaic device having multiple well quantum portions formed on a virtual substrate having a virtual substrate lattice constant different from a substrate lattice constant of an underlying substrate and identifies the virtual substrate as $\text{InP}_{1-x}\text{As}_x$, where zero is less than x is less than one, and said substrate is InP.

The Examiner has failed to point out where Freundlich I teaches the specific virtual substrate as recited in applicants' claim 18. A review of column 3, lines 58-62, cited by the Examiner, does not contain all of the limitations of applicants' claim 18 and therefore does not anticipate or render obvious the subject matter of claim 18 or claims 21-23 and 25-27 which are ultimately dependent from claim 18.

In section 12 of the Rejection, the Examiner rejects claims 19-22 and 24 as obvious in view of Freundlich I in view of Ekins-Daukes I. As noted above, Freundlich I does not contain all of the limitations set out in applicants' independent claim 18. The Examiner has not identified where Ekins-Daukes I discloses the missing specifications of the claimed "virtual substrate." Therefore, even the combination of Freundlich I and Ekins-Daukes I cannot render obvious the subject matter of claim 18 or claims 20 and 24 ultimately dependent thereon.

Claims 31-33 and 36-41 stand rejected as obvious over Freundlich I in view of Freundlich II as discussed in section 13 of the Rejection. Claims 31-33 and 36-41 ultimately depend from claim 18 and the above comments distinguishing claim 18 from the Freundlich I reference are herein incorporated by reference. Additionally, the Examiner has not pointed out how Freundlich II discloses the claimed aspects.

Claims 31-33 and 36-41 all ultimately depend from claim 18 and therefore the above comments distinguishing claim 18 over the Freundlich I reference are herein incorporated by reference. The Examiner has failed to note any disclosure in Freundlich II which supplies the missing interrelationship of the claimed "virtual substrate" and therefore neither reference teaches the subject matter of claim 18, let alone the subject matter of claim 18 as limited by claims 31-33 and 36-41.

In section 14 of the Rejection, the Examiner rejects claims 34 and 35 as unpatentable over Freundlich I in view of Freundlich II as previously applied to claims

31-33 and 36-41, and further in view of Ekins-Daukes I. The above comments regarding the Freundlich I/Freundlich II combination and the Ekins-Daukes I references are herein incorporated by reference. Additionally, there is no allegation by the Examiner that Ekins-Daukes I supplies the missing claim feature of claim 18 from which claims 34 and 35 ultimately depend. Therefore, we have the situation in which none of the three cited references teach one claimed feature of applicants' independent claim 18.

Moreover, Ekins-Daukes I, as noted in Dr. Anderson's Declaration, in teaching average strain balancing, would lead those of ordinary skill in the art away from applicants' claimed individual period strain balancing. As a result, one of ordinary skill in the art would not think to combine these three references and still arrive at applicants' claimed invention.

The subject matter of dependent claims 19 and 34 have been incorporated into parent claims 18 and 33, and it is noted that the "substantially no shear force" limitation is incorporated in each of these claims. Therefore, the above arguments regarding the fact that Ekins-Daukes I does not teach any way of achieving this desirable goal, confirm that there is no method or structure for achieving this goal disclosed in Ekins-Daukes I.

The Examiner's new rejections with respect to claims 44-58 is similarly misplaced as being allegedly obvious in view of Ekins-Daukes I. We have the Declaration of Dr. Anderson who establishes that Ekins-Daukes I does not teach a structure made in accordance with the conditions set out in claim 44.

Moreover, it should be understood that the Freundlich references do not mention nor recognize the importance of the elastic constants that are set out in the present formulae. The Freundlich references do not mention that these elastic constants differ between the material in the well and the barrier. Freundlich does not really define what is meant by "overall strain magnitude" and it is the Examiner's speculation that this may be related somehow to "substantially no shear force" as set out in the present claims. As a result, there is no basis for alleging that any of claims 44-58 are obvious over the Ekins-Daukes reference. This non-obviousness is confirmed by paragraphs 11 and 12 of the Declaration of Dr. Anderson, whether or not Ekins-Daukes I is combined with either of the recited Freundlich references.

The Examiner's comments in section 20 of the Official Action appear to take the position that regardless of whether Ekins-Daukes I teaches and provides enough information for one to provide layers which exert "substantially no shear force," because the prior art suggests that this is a desirable goal, they teach or render obvious this claimed interrelationship. This is not the case and the Examiner has cited no reference or citation of any Court of Appeals for the Federal Circuit or Board of Patent Appeals and Interferences case which supports this reasoning.

The Examiner's reasoning is, in fact, faulty because the undersigned can supply references to documents which discuss and purportedly disclose a perpetual motion machine. As is well known, the fact that a reference may say that a certain combination is desirable, that reference does not preclude others from patenting a method

or structure (especially if the prior art does not teach how to make the structure).

Because the cited Ekins-Daukes I reference does not indicate that it is even possible to make the combination or provide any way for one of ordinary skill in the art to make or practice the combination, it does not effectively teach the combination.

While a prior art reference might contain a suggestion for trying something in order to achieve a particular beneficial result, it does not teach or render obvious the ultimate combination under 35 USC §103. There are numerous Federal Circuit cases that clearly hold that "obvious to try" is not the standard of obviousness. There must be a sufficient disclosure in the prior art to obtain the suggested benefit, and, because there is insufficient teaching in Ekins-Daukes I (as confirmed by Dr. Anderson's Declaration), it cannot support any rejection of the claims in this case.

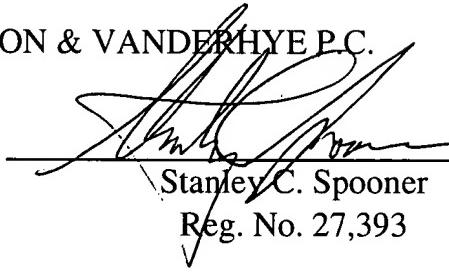
Having responded to all objections and rejections set forth in the outstanding Official Action, it is submitted that claims 1-18, 20-27, 31-33 and 35-58 are in condition for allowance and notice to that effect is respectfully solicited. In the event the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, he is respectfully requested to contact applicant's undersigned representative.

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Respectfully submitted,

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